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CHAPTER 1

ANNUAL EVALUATION REPORT

Fiscal Year 1986

GOVERNMENT DOCUMENTS
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INTRODUCTION

Fiscal Year 1986 marks the fourth year in which federally funded compensatory education operated under Chapter 1 of the Education Consolidation and Improvement Act of 1981 (ECIA) enacted as part of Subtitle D of Title V of the Omnibus Budget Reconciliation Act of 1981, P.L. 97-35. Chapter 1 ECIA provides financial assistance to state and local education agencies to meet the educational needs of educationally deprived students.

Fiscal year 1986 also marks the seventh year in which Massachusetts federally funded compensatory education programs have used the Title I Evaluation and Reporting System (TIERS) on a statewide basis. This system was developed by the U.S. Department of Education to collect and aggregate uniform data on levels of participation, parent activities, staffing and project impact on achievement test scores at the local, state and federal levels. Although evaluation requirements under Chapter 1, ECIA do not prescribe this reporting system for state and local Chapter 1 programs, Massachusetts continues to employ it in order to obtain a systematic and valid assessment of Chapter 1 services and their impact.

In the past six years, a sampling was employed and all totals and averages reported were estimates. FY 1986 marks the first year in which TIERS data have been collected from all Massachusetts Chapter 1 projects.

LEA PARTICIPATION AND FUNDING

PARTICIPATION OF MASSACHUSETTS LOCAL EDUCATIONAL AGENCIES

TABLE 1
NUMBER AND TYPE OF LOCAL EDUCATIONAL AGENCIES WITH CHAPTER 1 PROGRAMS

	Local	Regional	Vocational- Technical	*Other	TOTAL
Total Number of LEAs Which Operated Chapter 1 Programs	279	37	13	2	331
Number of LEAs Which Did Not Operate Chapter 1 Programs	4	15	14	4	37
Total Number of LEAs In Massachusetts	283	52	27	6	368

* Includes three Independent Vocational School Systems and three County Agricultural Schools

TABLE 1 shows the number of Massachusetts school districts which conducted Chapter 1 programs in Fiscal Year (FY) 1986. Almost all eligible local school districts utilized their Chapter 1 entitlement, while only 37 of the 52 regional school districts and only 13 of the 27 vocational-technical schools chose to operate a Chapter 1 program. Of the 368 school districts, 331 (90%) had Chapter 1 programs.

The actual number of Chapter 1 programs operating in FY86 was less than 331. This occurred because 63 school districts participated in 16 cooperative Chapter 1 programs. Thus, there were 284 (331-63+16) actual Chapter 1 programs in Massachusetts during FY86.

ALLOCATIONS BY COUNTY

Allocation to each county is based on the number of low-income children, aged 5-17 inclusive. Twenty-one percent of the state's total grant was earmarked for Suffolk County—Boston, Chelsea, Revere and Winthrop. In addition, nearly 16% of the statewide allocation was targeted for Middlesex County. This county includes Cambridge, Everett, Lowell, Malden and Somerville. Also, Essex, Hampden and Worcester counties each received over 11% of the total grant. TABLE 2 shows the allocation of Chapter 1 funds by county.

TABLE 2
ALLOCATION OF CHAPTER 1 FUNDS

County	Allocation
Barnstable	\$ 1,552,731.57
Berkshire	1,701,502.17
Bristol	7,090,249.19
Dukes	84,237.66
Essex	8,152,825.97
Franklin	764,050.34
Hampden	8,314,897.25
Hampshire	1,108,390.24
Middlesex	11,343,512.00
Nantucket	24,019.59
Norfolk	4,295,627.94
Plymouth	5,085,787.03
Suffolk	15,257,361.08
Worcester	8,113,416.54
TOTAL	\$72,888,608.55

DESCRIPTION OF CHAPTER 1 PROGRAMS

STUDENT PARTICIPATION

Massachusetts Chapter 1 programs reporting in FY86 indicate that there were 1,626 public schools, that 1,104 (67.9%) of them were eligible for Chapter 1 services, and that 1,037 (63.8%) of them received Chapter 1 services (see TABLES 3 and 4). More than ninety percent of all eligible public schools received services. Percentages of schools eligible and served were higher for schools classified as elementary and junior high and were lower for high schools.

TABLE 5 shows that the estimated number of students eligible for Chapter 1 services was 95,920 and that over 84% of these students actually received services. (Note that these data represent eligible students in eligible public schools. They do not include students who might have been eligible for Chapter 1 services if their school had been eligible.) Percentages of eligible students served were also higher in elementary and junior high schools. While over 91 percent of eligible students were served in junior highs, only 47.2 percent were served in high schools.

The number and percent of students served within Chapter 1 programs in both public and non-public schools is shown in TABLE 6. The concentration of students was in grades 1-6. These grades accounted for 56,324 (66.4%) of the total Chapter 1 student population. Pre-kindergarten and kindergarten programs accounted for 6,957 students or 8.2% of the total population, while 21,541 students (25.4%) were in secondary level Chapter 1 programs (grades 7-12).

The distribution across grades for both public and non-public programs was about the same. The percentage of students in grades 1-6 was slightly higher in non-public schools, and there were relatively more public school students in grades 7-12. Overall, 96% of the total number of chapter 1 students were served in the public schools and the remaining 4% within non-public schools.

TABLE 3
NUMBER OF PUBLIC SCHOOLS SERVED BY CHAPTER 1 BY GRADE SPAN

Grade Span	Total Number of Schools	Number of Eligible Schools	Number of Schools Served
Elementary (PreK-6)	1,116	792	780
Junior High (7-9)	269	180	159
High School (10-12)	241	132	98
TOTAL	1,626	1,104	1,037

TABLE 4
PERCENT OF PUBLIC SCHOOLS SERVED BY CHAPTER 1 BY GRADE SPAN

Grade Span	Percent of All Schools Eligible	Percent of All Schools Served	Percent of Eligible Schools Served
Elementary	71.0	69.9	98.5
Junior High	66.9	59.1	88.3
High School	54.8	40.7	74.2
TOTAL	67.9	63.8	93.9

TABLE 5
NUMBER AND PERCENT OF ELIGIBLE PUBLIC SCHOOL STUDENTS SERVED BY CHAPTER 1 BY GRADE SPAN

Grade Span	Number of Students Eligible	Number of Students Served	Percentage Students Served
Elementary	67,753	60,342	89.1
Junior High	16,916	15,550	91.9
High School	11,251	5,315	47.2
TOTAL	95,920	81,207	84.7

TABLE 6
NUMBER AND PERCENT OF STUDENTS SERVED BY CHAPTER 1 AT EACH GRADE LEVEL

Grade Level	Public Schools		Non-Public Schools		Total	
	Number	Percent	Number	Percent	Number	Percent
Pre-Kindergarten	1,744	2.1	2	0.1	1,746	2.1
Kindergarten	5,101	6.3	110	3.0	5,211	6.1
Grade 1	10,649	13.1	487	13.5	11,136	13.1
Grade 2	10,363	12.8	560	15.5	10,923	12.9
Grade 3	9,070	11.2	534	14.8	9,604	11.3
Grade 4	8,898	10.9	502	13.9	9,400	11.2
Grade 5	7,837	9.6	421	11.6	8,258	9.7
Grade 6	6,680	8.2	323	8.9	7,003	8.3
Grade 7	6,133	7.6	295	8.2	6,428	7.6
Grade 8	5,707	7.0	197	5.4	5,904	7.0
Grade 9	3,710	4.6	64	1.8	3,774	4.4
Grade 10	2,682	3.3	58	1.6	2,740	3.2
Grade 11	1,519	1.9	34	0.9	1,553	1.8
Grade 12	1,114	1.4	28	0.8	1,142	1.3
TOTAL (unduplicated count)	81,207	100.0	3,615	100.0	84,822	100.0

CHAPTER 1 SERVICES PROVIDED TO STUDENTS

The number of students receiving various types of instructional and supportive services is shown in TABLE 7. These numbers are also presented as percentages of the total of 84,822 students served. The most widely offered Chapter 1 service clearly was reading. Reading services were received by 55.5% of all participating students. Reading was followed by mathematics (27.7%), and other language arts (20%).

TABLE 7
NUMBER OF STUDENTS SERVED BY CHAPTER 1 IN EACH SERVICE AREA

Types of Services	Total Number of Students Served	Percent of Students Served
INSTRUCTIONAL		
Reading	47,043	55.5
Mathematics	23,460	27.7
Other Language Arts	16,974	20.0
Other Instructional Services	4,898	5.8
SUPPORTIVE SERVICES		
Health and Nutrition	3,897	4.6
Social and Emotional Development	4,849	5.7
Pupil Transportation	936	1.1
Other Support Services	811	1.0

The majority of Chapter 1 programs provided instructional services in a pull-out setting (see Table 8). Pull-out and regular classroom settings were employed in 93 percent of the reading programs, 94.6 percent of the mathematics programs, and 96.7 percent of language arts programs.

TABLE 8
PERCENT OF CHAPTER 1 PROJECTS PROVIDING INSTRUCTIONAL SERVICES IN DIFFERENT SETTINGS FOR EACH SUBJECT AREA

Project Setting	Reading	Mathematics	Language Arts
Pull-Out	67.1	66.0	69.3
Regular Classroom	8.8	8.4	11.5
Laboratory	1.5	0.0	0.0
Pull-Out and Regular Classroom	17.1	20.2	15.9
Pull-Out and Laboratory	3.7	3.0	1.1
Regular Classroom and Laboratory	0.9	1.0	1.1
Other	0.9	1.4	1.1
TOTAL	100.0	100.0	100.0

TYPE OF STAFF

TABLE 9 shows the amount and percentage of full-time equivalent staff employed in Chapter 1 programs during the regular school term. The vast majority of staff time in Chapter 1 programs (over 88%) can be accounted for by teachers and teacher-aides. In contrast, only 3.1% of Chapter 1 staff time was accounted for by administrative staff.

TABLE 9
NUMBER OF STAFF (in FTE's) EMPLOYED IN CHAPTER 1 PROJECTS IN EACH JOB CLASSIFICATION

Job Classification	Full-Time Equivalent	Percentage
Teachers	1,978	56.7
Teacher-Aides	1,105	31.6
Administrative Staff	108	3.1
Clerical Staff	96	2.7
Staff Providing Supportive Services	77	2.2
Curriculum Specialists	29	0.8
Parent Coordinators	21	0.6
Others (Tutors, Counselors, etc.)	81	2.3
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TOTAL	3,495	100.0

PARENT INVOLVEMENT

The total number of Chapter 1 parents who were elected members of parent advisory councils (PACs) during FY86 was 4,165 or 95 percent of all members (see TABLE 10). Others, including parents of non-Chapter 1 students and non-parents, accounted for the other 5 percent of the members. Over half (2,307) of PAC members received training related to advisory council activities.

Chapter 1 programs reported that PACs met on the average about four times a year (not counting the initial, "open house" meeting). The average attendance was a little over eight people. Sixty-four percent of all programs provided Chapter 1 funds for advisory council activities.

Chapter 1 programs also reported that 3,640 parents of Chapter 1 students participated in project planning, implementation and/or evaluation, and that 976 parents worked as volunteers in Chapter 1 activities.

TABLE 10
PARTICIPATION IN CHAPTER 1 PARENT ADVISORY COUNCILS

Types of PAC Members	Number	Percentage
Parents of Chapter 1 Public School Students	3,823	87.2
Parents of Chapter 1 Nonpublic School Students	342	7.8
Other	219	5.0
TOTAL	4,384	100.0

EFFECT ON EDUCATIONAL ACHIEVEMENT

OVERVIEW

As stated earlier in the Introduction to this report, the Title I Evaluation and Reporting System (TIERS) was designed to aggregate achievement test results for Chapter 1 students in grades 2-12 in the three basic skills areas: reading, mathematics and language arts. A Chapter 1 program may continue to utilize one of three basic evaluation designs to measure the impact of the program on their students. The three basic evaluation designs are:

- (1) *MODEL A*: the Norm-Referenced Model
- (2) *MODEL B*: the Comparison Group Model
- (3) *MODEL C*: the Special Regression Model

The three evaluation models utilize a common definition of project impact in measuring the effectiveness of a Chapter 1 program in improving student achievement. The impact attributed to the Chapter 1 program is defined as the difference between student performance on a post-test and an estimate of what this performance would have been had the students not participated in the Chapter 1 program. In brief, the project's overall impact is defined as the post-test performance minus the expected no-project performance.

	OBSERVED		EXPECTED
PROJECT IMPACT =	Post-Project	—	No-Project
	Performance		Performance

For all three evaluation models, the observed post-project performance is always the average post-test score of the project's Chapter 1 students. The expected no-project performance is derived differently in each of the three designs.

THE NORM-REFERENCED DESIGN: MODEL A

All of the Chapter 1 programs, except one, reporting achievement data in FY86 employed the Norm-Referenced Model. The one exception employed Model C. In the Model A evaluation design, the expected no-project performance is derived through comparisons with the achievement test publisher's national norms. The average pre-test score for the Chapter 1 students is compared to the distribution of scores obtained by the norm group at the same time of the school year. This comparison requires obtaining the percentile rank equivalent of the average pre-test score. It is assumed that the Chapter 1 students would have an average post-test score at the same percentile rank if they had not participated in the project. Thus, the expected no-project performance is the percentile rank of the group's average pre-test score and the observed post-project performance is the percentile rank of the average post-test score. If the percentile rank of the average post-test score is greater than the percentile rank of the average pre-test score, the difference is attributed to the effectiveness of the Chapter 1 program. If the difference is zero or negative, the Chapter 1 program is said to have no positive impact.

REPORTING STATEWIDE RESULTS

The statewide analysis of Chapter 1 impact was carried out by aggregating the impacts or gains, defined above, across all reporting Chapter 1 projects. Since Chapter 1 projects vary in terms of instructional subject areas (reading, language arts, or mathematics) and grades (2-12), separate aggregations were performed within these categories. Also, the test administration schedule for pre- and post-testing may influence the type of results a project can expect to achieve. Therefore, separate aggregations were carried out for Chapter 1 projects using a year-to-year testing schedule and those using a fall-to-spring schedule.

In order to aggregate program impact across Chapter 1 projects, the percentile ranks of the average pre- and post-test scores for each program were converted to an equal-interval scale, known as the Normal Curve Equivalent (NCE). This facilitated the aggregation of results from different programs.

The remainder of this section of the evaluation report presents the aggregated Chapter 1 project impact on student achievement in reading, mathematics, and language arts for grades 2 through 12 in Massachusetts for FY86. TABLES 11, 12 13, and 14 also contain national NCE mean gain (weighted mean) data in the subjects of reading and mathematics.

CHAPTER 1 IMPACT: ACHIEVEMENT TEST RESULTS

TABLE 11 shows the number of Chapter 1 program participants for whom both pre- and post-test achievement test scores were obtained during FY86. The number of participants tested is presented by the three basic skills areas—reading, mathematics, and language arts. In addition, the table breaks these numbers down by the different testing schedules employed to assess program impact.

Overall, the majority of Chapter 1 students tested participated in reading programs (29,504 or 57%). Of these, 70% were tested on a fall-to-spring schedule. Students in mathematics programs accounted for 31% of the students and language arts accounted for only twelve percent. Most students were tested using fall-to-spring schedules (74%). However, this represents a substantial decrease from the 90 percent reported in FY85.

TABLE 11
NUMBER OF STUDENTS WITH PRE-TEST AND POST-TEST
ACHIEVEMENT TEST SCORES IN SCHOOL YEAR PROJECTS, GRADES 2-12
FOR EACH SUBJECT AREA AND TESTING SCHEDULE

Subject Area	Testing Schedule		TOTAL
	Fall-to-Spring	Year-to-Year	
Reading	20,612	8,892	29,504
Mathematics	13,694	2,575	16,269
Language Arts	3,805	2,125	5,930
TOTAL	38,111	13,589	51,700

IMPACT OF READING PROGRAMS

The aggregated statewide Chapter 1 impact for students in reading programs is presented in TABLES 12 and 13. TABLE 12 reports these gains for projects which employed a fall-to-spring testing schedule. Projects with a fall-to-spring testing schedule had an average impact of 6.7 NCEs, while those which used a year-to-year schedule averaged 4.2 NCEs. For reading projects using a fall-to-spring testing schedule, within Massachusetts greater than average gains were made in grades 2, 3, 9 and 12. For projects utilizing a year-to-year testing schedule (see TABLE 13), the greater than average gains within Massachusetts were at grades 2, 4, 5, 8, 9 and 10.

Overall, TABLES 12 and 13 show a positive impact of the Chapter 1 reading instruction at almost all grade levels—regardless of the testing schedule employed to assess program effectiveness. TABLES 12 and 13 also contain national NCE data by grade level. TABLE 12 shows that Massachusetts Chapter 1 projects using a fall-to-spring testing schedule had gains greater than national gains in grades 8, 9, 10, 11 and 12 and TABLE 13 shows that Massachusetts Chapter 1 projects using an annual testing schedule had gains greater than national gains in grades 2, 4, 5, 6, 8, 9 and 10.

TABLE 12
READING ACHIEVEMENT RESULTS FOR SCHOOL YEAR PROJECTS
WITH FALL-TO-SPRING TESTING SCHEDULES—EXPRESSED IN
NORMAL CURVE EQUIVALENT (NCE) SCORES

Grade	Number of Students with Pre- and Post- Test Scores	NCE Post-test Mean (Weighted Mean)	Massachusetts NCE Mean Gain (Weighted Mean)	National NCE Mean Gain (Weighted Mean)
2	3,702	45.9	9.6	9.8
3	2,810	43.5	7.2	8.2
4	2,736	42.7	6.1	7.5
5	2,508	42.1	6.5	6.6
6	2,161	40.4	5.6	6.6
7	1,906	39.3	4.7	5.8
8	1,488	38.6	6.7	5.8
9	1,152	40.3	6.9	4.6
10	801	39.0	5.1	4.2
11	1,095	29.9	4.5	3.9
12	253	34.2	6.8	3.5
TOTAL	20,612	41.4	6.7	—

TABLE 13
READING ACHIEVEMENT RESULTS FOR SCHOOL YEAR PROJECTS
WITH YEAR-TO-YEAR TESTING SCHEDULES—EXPRESSED IN
NORMAL CURVE EQUIVALENT (NCE) SCORES

Grade	Number of Students with Pre- and Post- Test Scores	NCE Post-test Mean (Weighted Mean)	Massachusetts NCE Mean Gain (Weighted Mean)	National NCE Mean Gain (Weighted Mean)
2	1,120	42.1	4.7	1.1
3	1,135	39.0	0.5	2.8
4	1,411	40.7	0.5	3.1
5	1,320	40.8	5.4	3.1
6	1,109	39.8	3.8	3.5
7	793	35.4	1.8	2.6
8	1,040	35.6	8.0	2.6
9	391	33.6	4.3	2.4
10	274	29.0	5.0	1.3
11	147	25.1	-3.7	1.8
12	152	26.5	-0.7	-0.3
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TOTAL	8,892	38.3	4.2	—

IMPACT OF MATHEMATICS PROGRAMS

TABLES 14 and 15 present the aggregated statewide impact of Chapter 1 programs providing supplementary mathematics instruction. TABLE 14 shows NCE gains at all grade levels for programs employing a fall-to-spring testing schedule. The overall NCE mean gain was 10.0 within Massachusetts. Greater than average NCE gains were achieved in grades 2, 3, 4 and 9. TABLE 15 reports aggregated program impact by grade for programs using a year-to-year testing schedule. The average NCE gain of those mathematics programs was 7.7. Within Massachusetts above average gains for year-to-year programs were in grades 2 and 4. TABLES 14 and 15 also contain national NCE data by grade level. TABLE 14 shows that Massachusetts Chapter 1 projects using a fall-to-spring testing schedule had gains greater than national gains in grades 2, 4, 8, 9, 10, 11 and 12. TABLE 15 shows that Massachusetts Chapter 1 projects using an annual schedule had gains greater than national gains in grades 2, 3, 4, 5, 6, 7 and 8.

TABLE 14
MATHEMATICS ACHIEVEMENT RESULTS FOR SCHOOL YEAR PROJECTS
WITH FALL-TO-SPRING TESTING SCHEDULES—EXPRESSED IN
NORMAL CURVE EQUIVALENT (NCE) SCORES

Grade	Number of Students with Pre- and Post- Test Scores	NCE Post-test Mean (Weighted Mean)	Massachusetts NCE Mean Gain (Weighted Mean)	National NCE Mean Gain (Weighted Mean)
2	2,012	49.9	14.7	13.6
3	2,108	47.5	11.7	11.8
4	2,393	46.5	11.6	11.1
5	1,958	44.1	8.9	9.7
6	1,635	44.1	7.7	8.8
7	1,154	40.2	4.9	6.9
8	903	39.7	6.4	5.7
9	859	39.6	10.2	6.8
10	432	35.7	7.3	5.0
11	175	32.5	6.0	4.7
12	65	37.8	6.6	3.6
TOTAL	13,694	44.5	10.0	—

TABLE 15
MATHEMATICS ACHIEVEMENT RESULTS FOR SCHOOL YEAR PROJECTS
WITH YEAR-TO-YEAR TESTING SCHEDULES—EXPRESSED IN
NORMAL CURVE EQUIVALENT (NCE) SCORES

Grade	Number of Students with Pre- and Post- Test Scores	NCE Post-test Mean (Weighted Mean)	Massachusetts NCE Mean Gain (Weighted Mean)	National NCE Mean Gain (Weighted Mean)
2	343	46.1	8.4	5.2
3	380	43.3	7.7	3.6
4	585	48.4	12.7	3.9
5	398	41.0	6.0	5.3
6	364	41.7	6.7	4.0
7	232	35.7	4.0	3.7
8	273	35.6	3.4	2.4
<hr/>				
TOTAL	2,575	42.8	7.7	—

IMPACT OF LANGUAGE ARTS PROGRAMS

TABLE 16 and 17 present the aggregated statewide impact of Chapter 1 programs providing instructional services in language arts. For programs testing fall-to-spring, positive gains were made at all grade levels. The overall average gain was 7.7. Within Massachusetts above average gains were made at grades 2, 3, 4, 5 and 11. Programs evaluating year-to-year showed positive gains in all grades except grade 5. The overall average gain was 3.7. Above average gains were made in grades 2, 3, 4, 6 and 8. National language arts achievement results are not available.

TABLE 16
LANGUAGE ARTS ACHIEVEMENT RESULTS FOR SCHOOL YEAR PROJECTS
WITH FALL-TO-SPRING TESTING SCHEDULES—EXPRESSED IN
NORMAL CURVE EQUIVALENT (NCE) SCORES

Grade	Number of Students with Pre- and Post- Test Scores	NCE Post-test Mean (Weighted Mean)	Massachusetts NCE Mean Gain (Weighted Mean)
2	763	46.1	11.9
3	642	46.9	11.6
4	581	43.8	6.4
5	479	43.5	9.1
6	299	39.0	5.0
7	317	38.0	2.1
8	317	37.7	1.2
9	233	39.2	5.2
10	99	40.1	5.5
11	50	37.2	3.5
12	25	37.4	10.6
TOTAL	3,805	42.9	7.7

TABLE 17
LANGUAGE ARTS ACHIEVEMENT RESULTS FOR SCHOOL YEAR PROJECTS
WITH YEAR-TO-YEAR TESTING SCHEDULES—EXPRESSED IN
NORMAL CURVE EQUIVALENT (NCE) SCORES

Grade	Number of Students with Pre- and Post- Test Scores	NCE Post-test Mean (Weighted Mean)	Massachusetts NCE Mean Gain (Weighted Mean)
2	124	37.8	3.9
3	248	42.9	4.4
4	489	53.4	9.2
5	472	45.0	-4.0
6	442	45.4	5.8
7	199	38.7	2.3
8	155	37.5	4.4
TOTAL	2,129	45.2	3.7

